

**TWO NEW SUBSPECIES OF *OGYRIS OTANES* C. & R. FELDER
(LEPIDOPTERA: LYCAENIDAE) FROM WESTERN AUSTRALIA**MATTHEW R. WILLIAMS¹ and ROBERT W. HAY²¹*Department of Conservation and Land Management, Locked Bag 104, Bentley Delivery
Centre, WA 6983*²*8 Klem Ave, Salter Point, WA 6152***Abstract**

Ogyris otanes sublustris subsp. nov. and *Ogyris otanes arcana* subsp. nov. are described from western coastal and southern Western Australia respectively. A lectotype is designated for *Ogyris otanes* C. & R. Felder. The new subspecies are compared with *O. otanes* from Kangaroo Island, South Australia and from near Yanac, western Victoria. The distribution, conservation status and life histories of the two new subspecies are reviewed.

Introduction

Waterhouse and Lyell (1914) recorded three specimens of *Ogyris* Angas from the Stirling Range, Western Australia, which they identified as *Ogyris otanes* C. & R. Felder, commenting that they were possibly a distinct subspecies. The Australian Museum Register and the labels on the specimens indicate that they were collected by F. L. Whitlock at the western end of the Stirling Range in October 1911. This population was rediscovered by Peter Valentine, Hugh Bollam and one of us (RWH) in 1988. Examination of additional specimens confirmed Waterhouse and Lyell's conjecture that specimens from this population could readily be distinguished from eastern Australian populations (Hay 1989).

In 1977 David Knowles discovered another population of *O. otanes* near Leeman, north of Perth (Hart and Powell 1997). This population was both geographically and morphologically distinct from that of the Stirling Range and even more distinct from eastern Australian populations of *O. otanes*. Dunn and Dunn (1991) referred to the Stirling Range and Leeman populations as local forms, suggesting that the two populations 'may be shown to be connected by isolated transitional forms'. They also observed that the distribution of the species in Western Australia was poorly documented. Subsequently, surveys reported by Field (1990), Williams *et al.* (1992, 1995, 1996) and Hart and Powell (1997) have better delineated the distribution of both forms and provided more specimens for examination. Braby (2000) recognised three distinct forms ('eastern', 'south-western' and 'western coastal') but did not formalise subspecific nomenclature.

We compared the two Western Australian forms with *O. otanes otanes* from Kangaroo Island, South Australia and from near Yanac, western Victoria (referred to as eastern Australian populations). The results of this examination show that although adults of both the Western Australian forms resemble *O. otanes* from eastern Australia, there are some striking and consistent differences both between the two Western Australian forms and in

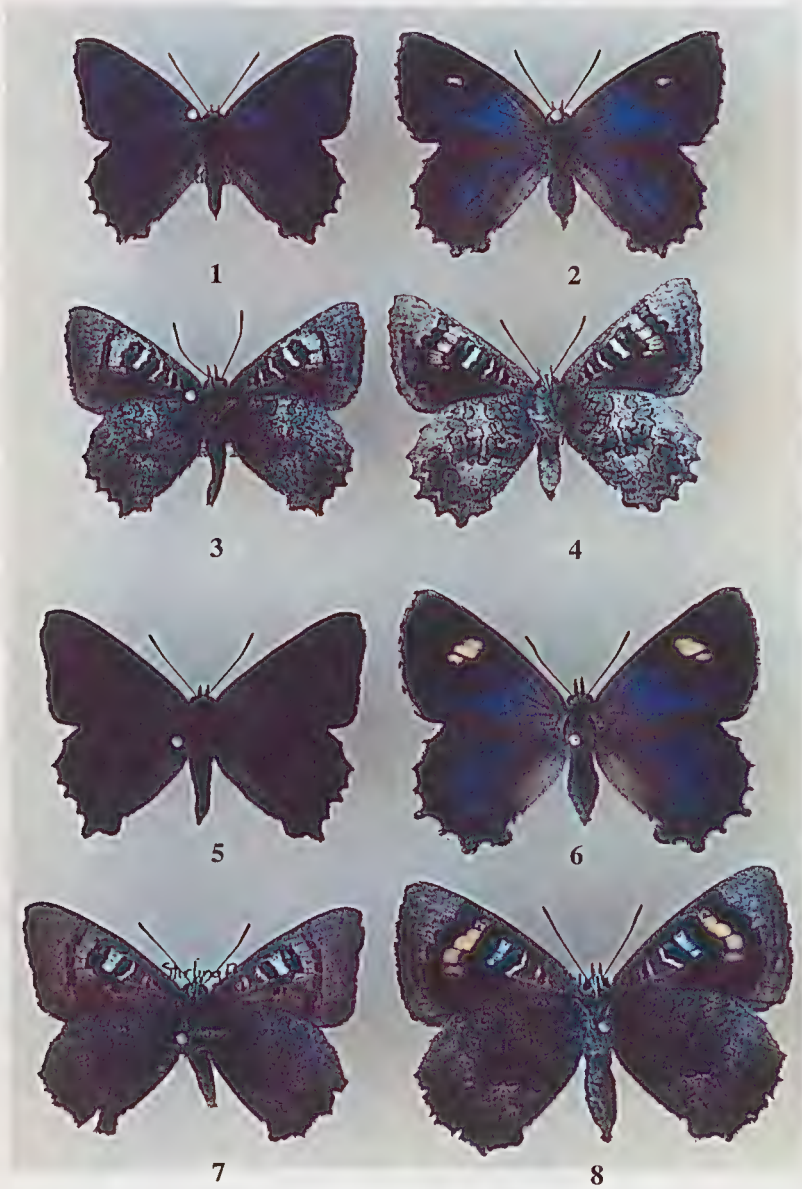
comparison to *O. otones* from eastern Australia. These differences warrant subspecific status for each of the two Western Australian forms.

Ogyris otones sublustris subsp. nov.

(Figs 1-4)

Types. *Holotype* ♂, WESTERN AUSTRALIA: Port Denison, 13.xi.1993, M.R. Williams (in Western Australian Museum). *Paratypes*: 1 ♂, 1 ♀, Leeman, ex p[upa], 2.xi.[19]87, R. H[ay], first ever Leeman *Ogyris* ex pupa; 3 ♂, 15 ♀, Leeman, ex p, R.H., 25.x.[19]88 (2♀), 26.x.[19]88 (1♀), 10.xi.[19]88 (1♀), 13.xi.[19]88 (1♀), 1.xii.[19]88 (1♀), 6.xi.[19]89 (1♂), 8.x.[19]90 (1♀), 29.x.[19]90 (1♂), 2.xi.[19]90 (1♀), 14.xi.[19]90 (1♂), 6.xi.[19]93 (2♀), 7.xi.[19]93 (1♀), 9.xi.[19]93 (1♀), 16.xi.[19]93 (3♀); 1 ♂, 1 km N of Leeman, 28.xii.1980, T.M.S. Hanlon; 5 ♂, 5 ♀, Leeman, 15.x.[19]85 (1♀), 16.x.[19]85 (1♂, 1♀), 17.x.[19]85 (2♂, 1♀), 23.ix.[19]87 (1♀), 8.ix.[19]88 (1♀), 28.ix.[19]89 (1♂), 26.ix.[19]90 (1♂); 5 ♂, 7 ♀, Port Denison, R.H., 24.ix.[19]92 (3♂, 2♀), 28.ix.[19]93 (2♀), 12.x.[19]94 (2♂, 3♀) (all in R.W. Hay collection); 6 ♂, 6 ♀, Leeman, [H.H. Bollam], 14.x.[19]85 (1♀), 15.x.[19]85 (2♂), 17.x.[19]86 (1♂), 4.xii.[19]86 (1♀), 9.ix.[19]88 (1♂), 15.x.[19]89 (1♂), 15.xi.[19]89 (1♀), 30.x.[19]90 (1♀), 1.xi.[19]90 (1♀), 2.xi.[19]90 (1♂), 7.xi.[19]90 (1♀), (all in H.H. Bollam collection); 11 ♀, as holotype but 6 dated 24.ix.1992, the remainder 28.ix.1992, 12.xi.1993, 13.xi.1993, 26.xi.1993 and 12.x.1994; 1 ♂, 2 ♀, 1 km S P[ort] Denison, 12.x.1994, M.R. Williams; 12 ♂, 21 ♀, Leeman, M.R. Williams, 25.ix.1990 (1♀), 27.x.1990 (1♀), 28.x.1990 (2♂, 1♀), 29.x.1990 (1♀), 1.xi.1990 (2♂, 1♀), 2.xi.1990 (2♂), 4.xi.1990 (1♀), 8.xi.1990 (1♀), 11.xi.1990 (1♀), 23.ix.1992 (2♂), 27.ix.1993 (2♀), 6.xi.1993 (1♂, 2♀), 9.xi.1993 (1♂, 3♀), 13.xi.1993 (2♀), 14.xi.1993 (1♀), 15.xi.1993 (1♂, 1♀), 16.xi.1993 (1♂, 2♀); 1 ♂, 2.6 km S of Lancelin, 31°02'S 115°21'E, 21.x.1997, M.R. Williams (all in CALM collection, Kensington); 1 ♂, 3 ♀, Port Denison, M.R. Williams, 14.xi.1993 (1♀), 15.xi.1993 (1♂), 20.xi.1993 (1♀), 21.xi.1993 (1♀); 1 ♂, 2 ♀, 1 km south of Dongara, sheltered area between vegetated secondary sand dunes just south of Dongara, 12.x.1994, A.A.E. Williams; 1 ♂, 10 ♀, 226 km north of Perth, Leeman, larval food plant *Leptomeria preissiana* at night, ant associated, A.A.E. Williams, 3.xi.1990 (1♀), 4.xi.1990 (1♀), 5.xi.1990 (2♀), 9.xi.1990 (1♀), 10.xi.1990 (1♂, 2♀), 11.xi.1990 (1♀), 20.xi.1990 (1♀), 23.xi.1990 (1♀); 3 ♂, 2 ♀, 226 km north of Perth, Leeman, flying along firebreak, very dense coastal scrub on limestone pavement, 26.ix.1990, A.A.E. Williams; 1 ♀, 2.6 km South of Lancelin, on near coastal dunes *Leptomeria preissii* [sic], 31°02.417'S 115°20.650'E, 21.x.1997, A.A.E. Williams (all in CALM collection, Woodvale).

Description. Male (Figs 1, 3). Head grey, vertex with mixed dark grey and white scales, frontoclypeus with two lateral and one median vertical bands of white scales with dark grey scales between; antennal shaft black ringed with white, six basal sections with two longitudinal black and white stripes, club expanding gradually from shaft; labial palpi pale grey consisting of scattered white and pale grey scales, terminal segment dark grey; eyes smooth. Thorax black above with pale grey hair scales becoming brown-grey anteriorly and posteriorly, beneath pale grey, legs pale grey consisting of mixed white and grey scales. Abdomen above grey consisting of dark grey and white scales mixed, whiter beneath.



Figs 1-8. *Ogyris otanes* subspecies. (1-4) *O. o. sublustris* subsp. nov. (1) Upperside holotype male; (2) upperside paratype female; (3) underside paratype male; (4) underside paratype female. (5-8) *O. o. arcana* subsp. nov. (5) upperside holotype male; (6) upperside paratype female; (7) underside paratype male; (8) underside paratype female.

Forewing costa convex near base then straight, apex sharply rounded, termen almost straight, slightly concave in middle; above brownish purple with a dark grey marginal band along termen, base of costa with coppery brown scales and some white and pale blue scales near apex, cilia white, dark grey at end of veins. Forewing beneath grey; apical half of wing heavily marked with white scales, from the base to just beyond the discal cell, a series of five transverse white bars, distal three bars enclosing median and postmedian bands of black, each centred with brilliant blue scales. Proximal two white bars enclosing a subcostal area of dark brown. Beyond the discal cell, a black bar extending from just below the costa to CuA_2 , present below CuA_2 but dark brown and less distinct, a narrow subterminal line from well below apex to CuA_2 , cilia grey tipped with white, grey at end of veins. Hindwing termen rounded and produced slightly at end of veins; tornus produced at end of CuA_2 , anal lobe developed; above brownish-purple, costa and termen broadly dark grey; tornus and anal lobe with scattered white scales, cilia white, dark grey at ends of veins and towards costa and tornus, hair scales brown. Hindwing beneath pale grey; with complex pattern of lines and bars usual in *Ogyris*, lines dark grey, bars brown-grey, an area of suffused grey and brown towards termen, cilia white. Length of forewing 17-20 mm.

Genitalia. Uncus slightly peaked, tip depressed, posterior margin very slightly concave above and more sharply convex below middle; valva bilobed, short; aedeagus simple (E. D. Edwards, pers. comm.).

Female (Figs 2, 4). Head, thorax and abdomen as in male. Forewing costa slightly convex at base then slightly rounded; termen rounded. Forewing above with subcostal areas grey-brown, basal third of costal half of wing and basal two thirds of dorsal half of wing bright purple suffused with some brown scales; apex with scattered white scales. A series of three pale yellow-white spots just beyond end of cell, extending from M_1 to CuA_1 , ground colour separating spots along M_3 and M_2 , with spots below M_1 and M_3 much smaller than that below M_2 and sometimes absent. Cilia white, dark grey at tips of veins. Forewing beneath as in male but area between black bars beyond cell between M_1 and CuA_1 pale cream with veins pale grey. Hindwing with termen rounded, produced at end of veins, most strongly on M_3 and CuA_2 . Anal lobe present; above dark grey forming a broad marginal band; central area bright purple, area around end of cell dark grey; hair scales brown; anal area pale grey, tornus with scattered white and blue scales, cilia white, dark grey at tips of veins. Hindwing beneath as in male but paler, a dark grey and brown suffusion in centre of wing. Length of forewing 16-20 mm.

Etymology. The subspecific name *sublustris* means darkling or less than brilliant and refers in particular to the colour of the upperside of the male.

Larval food plant. *Leptomeria preissiana* (Santalaceae).

Distribution. *Ogyris otanes sublustris* occurs from 3 km S of Lancelin to 1 km S of Port Denison (between 110 and 320 km N of Perth; Hart and Powell 1997, Williams *et al.* 1995). It is restricted to areas within about 5 km of the coast. Within this general area four apparently disjunct populations are known: (1) within a narrow strip approx 1-2 km S of Port Denison, between the townsite and the airport on the landward side of the fore dunes; (2) from a number of localities between 5 km north and 7 km south of the Leeman townsite; (3) 16 km N of Jurien Bay; and (4) between 1 and 3 km S of Lancelin.

***Ogyris otanes arcana* subsp. nov.**

(Figs. 5-8)

Types. *Holotype* ♂, WESTERN AUSTRALIA: Stirling Ra[nge], 7.xii.1990, M.R. Williams (in Western Australian Museum). *Paratypes*: 11 ♂, 11 ♀, as holotype but dated 6.xi.1990 (2♂), 7.xi.1990 (3♂, 4♀), 9.xi.1990 (1♀), 30.xi.1990 (1♂), 1.xii.1990 (1♂), 3.xii.1990 (1♂, 1♀), 5.xii.1990 (1♀), 6.xii.1990 (1♂), 7.xii.1990 (1♀), 8.xii.1990 (1♂, 3♀), 10.xii.1990 (1♂); 2 ♂, 2 ♀, Stirling Ra. NP, ex pupa, M.R. Williams, 2.xii.1991 (2♂, 1♀), 12.xii.1991 (1♀); 1 ♂, 2 ♀, Stirling Ra. NP, ex *C. glomeratum*, 21.xi.1991 (1♀), 25.xi.1991 (1♂), 27.xi.1991 (1♀), M.R. Williams; 3 ♂, 1 ♀, Stirling Ra., e[x] p[upa], M.R. Williams, 4.xii.1993 (1♂, 1♀), 5.xii.1993 (2♂); 3 ♀, Cape Arid NP, ep, M.R. Williams, 6.xii.1994, 12.xii.1994 and 17.xii.1994; 1 ♀, Cape Arid NP, 33°32'42"S 123°31'22"E, ep 3.xii.1994, M.R. Williams (all in CALM collection, Kensington); 5 ♂, 9 ♀, Stirling Range, larva, ex p, R. H[ay], 5.xi.[19]88 (1♂, 1♀), 30.xi.[19]88 (1♂, 1♀), 1.xii.[19]88 (1♀), 2.xii.[19]88 (1♂), 8.xii.[19]88 (1♀), 8.xii.[19]90 (1♀), 12.xii.[19]90 (1♀), 17.xii.[19]90 (1♀), 14.xii.[19]93 (1♂), 16.xii.[19]93 (1♀), 22.xii.[19]93 (1♀), 25.xii.[19]93 (1♂); 6 ♂, 8 ♀, larva ex Wylie Scarp, reared ex p, R.W.H., 21.xi.[19]91 (2♀), 22.xi.[19]91 (2♂, 1♀), 24.xi.[19]91 (2♂), 26.xi.[19]91 (1♀), 27.xi.[19]91 (1♀), 28.xi.[19]91 (1♂, 1♀), 2.xii.[19]91 (1♀), 4.xii.[19]91 (1♀), 5.xii.[19]91 (1♂); 1 ♂, Stirling Ra, R.H., 2.xi.[19]88 (all in R.W. Hay collection); 6 ♂, 5 ♀, Stirling R[ange], [H.H. Bollam], 19.xi.[19]88 (1♂), 30.xi.[19]88 (1♂, 2♀), 5.xii.[19]88 (2♀), 5.i.[19]89 (1♂), 8.i.[19]89 (1♀), 12.iii.[19]89 (1♂), 2.xi.[19]89 (1♂), 13.xi.[19]89 (1♂), (all in H.H. Bollam collection); 3 ♂, 3 ♀, Stirling Range Nat. Park, ex pupa, larvae attended by ants on *Choretrum glomeratum* shrubs (MRW), A.A.E. Williams, 13.xi.1991 (1♀), 15.xi.1991 (1♂), 17.xi.1991 (1♀), 21.xi.1991 (1♂), 22.xi.1991 (1♂), 24.xi.1991 (1♀); 1 ♂, Stirling Range Nat Park, 1.8 km SW Mt Gog, scenic hilltop lookout with mixed low mallee and heath vegetation, 27.i.1994, A.A.E. Williams; 1 ♂, Stirling Range Nat. Park, Salt River Rd 5.3 km east of Red Gum Pass Road junction, 4.xi.1997, A.A.E. Williams; 1 ♂, Cape Arid National Park, Gora Road, old burnt mallee scrub habitat on Gora Road, 33°32'42"S 123°31'22"E, 6.xi.1994, A.A.E. Williams; 1 ♀, Cape Arid National Park, Gora Road, ex pupa from ants' nest at base of food plant, 22.xii.1994, A.A.E. Williams (all in CALM collection, Woodvale).

Description. Male (Figs 5, 7). Head grey, vertex with dark grey and white scales, frontoclypeus with two lateral and one median vertical bands of white scales with dark grey scales between; antennal shaft black ringed with grey, club expanding gradually from shaft; labial palpi pale grey consisting of scattered white and pale grey scales, terminal segment dark grey; eyes

smooth. Thorax black above with brown-grey hair scales becoming brown anteriorly and posteriorly, beneath grey, legs pale grey consisting of mixed white and grey scales. Abdomen above dark grey consisting of dark grey and grey scales mixed, lighter beneath.

Forewing costa convex near base then straight, apex sharply rounded, termen almost straight, slightly concave in middle; above deep brownish purple with basal areas dusted blue, dark grey marginal band along termen, base of costa with brown scales, cilia grey, dark grey at end of veins. Forewing beneath grey-brown; apical half of wing marked with light grey scales; from the base to just beyond the discal cell a series of five transverse light coloured bars, the basal two white, the next two light blue and the final postmedian bar light brown to light grey. Distal three bars enclosing median and postmedian bands of black, each centred with brilliant blue or blue-purple scales. Proximal two white bars enclosing a subcostal area of dark brown. Beyond the discal cell a black bar extending from just below the costa to CuA_2 , present below CuA_2 but dark brown and less distinct, cilia grey, dark grey at end of veins. Hindwing termen rounded and produced slightly at end of veins; tornus produced at end of CuA_2 ; anal lobe developed; above brownish-purple, costa and termen broadly dark grey; cilia grey, dark grey at ends of veins and towards costa and tornus, hair scales brown. Hindwing beneath dark grey with very obscure pattern of dark brown bars, an area of suffused coppery brown towards termen, cilia grey. Length of forewing 18-22 mm.

Female (Figs 6, 8). Head, thorax and abdomen as in male. Forewing costa slightly convex at base then slightly rounded; termen rounded. Forewing above with subcostal areas grey-brown, basal half of costal half of wing and basal three-quarters of dorsal half of wing bright purple or bluish-purple, suffused with some brown scales. A series of three pale yellow-white spots just beyond end of cell, extending from M_1 to CuA_1 , the spots below M_1 and M_2 fused, that below M_2 separate, smaller and sometimes absent, occasionally a fourth yellow-white spot between CuA_1 and CuA_2 . Cilia grey, dark grey at tips of veins. Forewing beneath as in male but black bands broader, a yellow band between M_1 and CuA_2 beyond the discal cell replacing the light brown or grey band in males. Hindwing with termen rounded, produced at end of veins, most strongly on M_3 and CuA_2 . Anal lobe present; above dark grey forming a broad marginal band, basal two-thirds bright purple or bluish-purple, area around end of cell dark grey, hair scales brown; anal area light brown; tornus with scattered grey and blue scales, cilia grey, dark grey at tips of veins. Hindwing beneath as in male but lighter with markings more distinct. Length of forewing 19-24 mm.

Etymology. The subspecific name *arcana* means lost or hidden and refers to the long period between the initial discovery by Whitlock and the eventual rediscovery.

Larval food plant. *Choretrum glomeratum* (Santalaceae).

Distribution. Specimens have been collected at a number of sites in the Stirling Range National Park and the adjacent Camel Lake Nature Reserve, in Cape Arid National Park and the adjacent Nuytsland Nature Reserve, and at Israelite Bay (Max Moulds, pers. comm.). Two specimens taken at Pink Lake near Esperance by Ross Field may belong here but have been excluded from the type series. Field (1987) believed these two specimens, both males, to be more closely allied to *O. o. sublustris*, although he noted two characters (more extensive blue bands on the underside of the forewing and narrower dark brown bands beneath) that suggest alliance to *O. o. arcana*. Until further material, particularly females, is available from this site, there is little point conjecturing on the significance or taxonomic status of these two specimens.

Conservation status

Ogyris o. sublustris occurs in four apparently disjunct populations within a restricted coastal strip between Lancelin and Port Denison (Williams *et al.* 1995, Hart and Powell 1997). The Port Denison site in particular and parts of the Leeman site are threatened by urban expansion. The sites to the south of Lancelin and around Leeman are within town and Shire reserves and may be similarly threatened in future. The site north of Jurien Bay and part of the site around Leeman are within the Beekeeper's Nature Reserve. Hart and Powell (1997) suggested that *O. o. sublustris* may occur further north or south of the current distribution, in sites further inland, or in a number of nature reserves in the area, but there is no evidence to support any of these conjectures. Surveys conducted in this region by us and others, including Hugh Bollam, Paul Hutchinson, Trevor Lundstrom and Andy Williams, plus a survey by Grant Miller (pers. comm.), who collected at a site 14 km N of Dongara in 1974, failed to locate any new sites for *O. o. sublustris*.

The future of the site at Port Denison, where *O. o. sublustris* flies together with *O. idmo* Hewitson, is of particular concern. This is the only site known where both these species fly together and it is also the northernmost limit for both species. Some morphological differences have also been noted for both species at this site (Williams *et al.* 1995).

We recommend that *O. o. sublustris* be considered Vulnerable; the threatening process is clearing of habitat as a result of increasing urbanisation and development of coastal areas. Better knowledge of the extent of its occurrence within conservation reserves is needed, as well as additional information on appropriate management of its restricted habitat.

O. o. arcana occurs across a wide area of southern Western Australia and at a number of sites within two major National Parks. Although there is some evidence of displacement from previously utilised sites by *Hypochrysops ignitus* (Leach) (pers. obs.), this does not appear to be a threat. However, further monitoring of the processes involved would be of value and better knowledge of appropriate management of this taxon is needed. In the absence

of any known threatening process, we recommend that this taxon be considered Lower Risk (Least Concern).

Discussion

Ogyris otanes was described from more than one specimen as both sexes were illustrated and described. A male from the Felder collection, now in The Natural History Museum, London (BMNH), labelled 'Austral. Merid. Adelaide Angas, *Ogyris otanes* Feld., Type, Felder Colln, *otanes* n' is hereby designated as the lectotype.

Females of *O. o. sublustris* are easily distinguished from *O. o. otanes* and *O. o. arcana* by the much reduced pale yellow spot on the forewing. The purple areas on the upperside of both wings are reduced, often with ground colour along the veins, and are more heavily dusted with brown scales. Females of *O. o. sublustris* also have a more pointed apex and a slightly more produced tornus of the hindwing. In males, the subterminal band on the underside of the forewing is prominent. Both sexes of *O. o. sublustris* are characterised by lighter colour overall than *O. o. arcana*, with grey scales at the apex of the forewing above and on the projections of the hindwing tails above and a generally lighter ground colour below. The cilia edging the wings are also much lighter. This subspecies is also smaller in size than *O. o. arcana* and *O. o. otanes*, with forewing lengths for males 17-20 mm and females 16-20 mm. The food plant of *O. o. sublustris* is *Leptomeria preissiana*, whereas the food plant of both *O. o. otanes* and *O. o. arcana* is *Choretrum glomeratum* (both Santalaceae).

In *O. o. arcana* the undersides of both sexes, but particularly males, are so dark that the cryptic markings are largely obscured. The uppersides of *O. o. arcana* females are similar to eastern females of *O. o. otanes*.

O. o. sublustris and *O. o. arcana* differ from *O. o. otanes* in having a more acute apex and a straighter termen to the forewing. Both sexes also have a slightly narrower hindwing and the projection from vein CuA_2 and the anal lobe is more accentuated. Males of both *O. o. sublustris* and *O. o. arcana* are much darker than eastern populations. The undersides of both sexes are darker and have a distinct grey colour that contrasts markedly with the brown colour of eastern populations.

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